

IN THE CLAIMS

Listing of Claims

1. (Previously Presented) A modulation apparatus comprising:  
a first frequency-increasing single side band (SSB) modulator that performs SSB  
modulation on a first input symbol to obtain an upper side band (USB) signal;  
a second frequency-increasing SSB modulator that performs the SSB modulation on a  
second input symbol to obtain a lower side band (LSB) signal; and  
a combiner that combines the USB signal and the LSB signal,  
wherein the second frequency-increasing SSB modulator performs SSB modulation to  
obtain the LSB signal using a carrier frequency, the carrier frequency being higher than a carrier  
frequency used in the first frequency-increasing SSB modulator by a fundamental frequency of  
the first input symbol and the second input symbol, such that the LSB signal and the USB signal  
are multiplexed in the same frequency band.

2. (Withdrawn) A demodulation apparatus comprising:  
a first frequency-decreasing demodulator that demodulates an input modulation signal by  
a cosine curve with a predetermined carrier frequency to obtain a first demodulation signal; and  
a second frequency-decreasing demodulator that demodulates an input modulation signal  
by a sine curve with a carrier frequency higher than the carrier frequency used in the first  
frequency-decreasing demodulator by the fundamental frequency of a symbol.

3. (Withdrawn) A demodulation apparatus comprising:
  - a detector that performs quadrature detection on an input modulation signal by a predetermined carrier frequency to obtain a first detection signal and a second detection signal;
  - an analog/digital converter that quantizes the first detection signal and the second detection signal with an over-sampling frequency four times or more an entire bandwidth of the detection signal;
  - a FFT circuit that performs Fourier transform on the first detection signal and the second detection signal quantized; and
  - a signal detector that detects a signal before being modulated based on an output signal of the FFT circuit, using a signal in each carrier frequency and another signal in an adjacent frequency on a USB or LSB side.

4. (Previously Presented) A modulation method comprising:
  - an upper side band (USB) signal forming step of performing single side band (SSB) modulation on a first input symbol to obtain a USB signal;
  - a lower side band (LSB) signal forming step of performing the SSB modulation on a second input symbol to obtain an LSB signal; and
  - a combining step of combining the USB signal and the LSB signal,  
wherein, in the LSB signal forming step, the SSB modulation is performed using a carrier frequency, the carrier frequency being higher than a carrier frequency used in the USB signal forming step by a fundamental frequency of the first input symbol and the second input symbol, such that the LSB signal and the USB signal are multiplexed in the same frequency band.

5. (Withdrawn) A demodulation method comprising:

    a first demodulation step of demodulating a modulation signal by a cosine curve with a predetermined carrier frequency to obtain a first demodulation signal; and

    a second demodulation step of demodulating a modulation signal by a sine curve with a carrier frequency higher than the carrier frequency used in the first demodulation step by the fundamental frequency of an symbol.

6. (Previously Presented) A demodulation apparatus for demodulating a signal combined by the combiner in the modulation apparatus according to claim 1, the demodulation apparatus comprising:

    a first frequency-decreasing demodulator that demodulates an input modulation signal by a cosine curve with a first carrier frequency to obtain a first demodulation signal; and

    a second frequency-decreasing demodulator that demodulates the input modulation signal by a sine curve with a second carrier frequency to obtain a second demodulation signal, wherein

        the second carrier frequency is higher than the first carrier frequency by the fundamental frequency of the first input symbol and the second input symbol.

Claim 7 (Cancelled).

8. (Previously Presented) A demodulation method of demodulating a signal combined in the combining step of the modulation method according to claim 4, the method comprising:

a first demodulation step of demodulating a modulation signal by a cosine curve with a first carrier frequency to obtain a first demodulation signal; and

a second demodulation step of demodulating the modulation signal by a sine curve with a second carrier frequency to obtain a second demodulation signal, wherein

the second carrier frequency is higher than the first carrier frequency by the fundamental frequency of the first input symbol and the second input symbol.